

**§ 154.1870 Bow and stern loading.**

(a) When the bow or stern loading piping is not in use, the master shall lock closed the shut-off valves under § 154.355(a)(4) or remove the spool piece under § 154.355(a)(4).

(b) The person in charge of cargo transfer shall ensure that after the bow or stern loading piping is used it is purged of cargo vapors with inert gas.

(c) The person in charge of cargo transfer shall ensure that entrances, forced or natural ventilation intakes, exhausts, and other openings to any deck house alongside the bow or stern loading piping are closed when this piping is in use.

(d) The person in charge of cargo transfer shall ensure that bow or stern loading piping installed in the area of the accommodation, service, or control space is not used for transfer of the following:

- (1) Acetaldehyde.
- (2) Ammonia, anhydrous.
- (3) Dimethylamine.
- (4) Ethylamine.
- (5) Ethyl Chloride.
- (6) Methyl Chloride.
- (7) Vinyl Chloride.

**§ 154.1872 Cargo emergency jettisoning.**

(a) The master shall ensure that emergency jettisoning piping under

§ 154.356, except bow and stern loading and discharging piping, is only used when an emergency exists.

(b) Emergency jettisoning piping when being used may be outside of the transverse tank location under § 154.310.

(c) The master shall ensure that cargo is not jettisoned in a U.S. port.

(d) When ethylene oxide is carried, the master shall ensure that the emergency jettisoning piping with associated pumps and fittings is on-line and ready for use for an emergency.

(e) The master shall lock closed the shut-off valves under § 154.356 when the emergency jettisoning piping is not in use.

(f) The person in charge of cargo transfer shall ensure that after the emergency jettisoning piping is used it is purged of cargo vapors with inert gas.

(g) The person in charge of cargo transfer shall ensure that entrances, forced or natural ventilation intakes, exhausts, and other openings to accommodation, service, or control spaces facing the emergency jettisoning piping area and alongside the emergency jettisoning piping are closed when this piping is in use.

TABLE 4—SUMMARY OF MINIMUM REQUIREMENTS

Cargo name <sup>1</sup>	Ship type	Independent tank type C required	Control of cargo tank vapor space	Vapor detection <sup>2</sup>	Gauging <sup>3</sup>	Electrical hazard class and group <sup>4</sup>	Special requirements
Acetaldehyde	IIG/IIPG ..	.....	Inert .....	I & T .....	C .....	I-C .....	154.1410 (c), 154.1410, 154.1710, 154.1720, 154.1870.
Ammonia, anhydrous.	IIG/IIPG ..	.....	.....	T .....	C .....	I-D .....	154.1000, 154.1400 (c), 154.1405, 154.1410, 154.1702 (b), (c), (e), 154.1760, 154.1870.
Butadiene .....	IIG/IIPG ..	.....	Inert .....	I .....	R .....	I-B .....	154.1702 (b), (d), (f), 154.1710, 154.1750, 154.1818.
Butane .....	IIG/IIPG ..	.....	.....	I .....	R .....	I-D .....	None.
Butylene .....	IIG/IIPG ..	.....	.....	I .....	R .....	I-D .....	None.
Dimethylamine	IIG/IIPG ..	.....	.....	I & T .....	C .....	I-C .....	154.1400 (c), 154.1405, 154.1410, 154.1702 (b), (c), (e), 154.1870.
Ethane .....	IIG .....	.....	.....	I .....	R .....	I-D .....	None.
Ethylamine .....	IIG/IIPG ..	.....	.....	I & T .....	C .....	I-C .....	154.1400 (c), 154.1405, 154.1410, 154.1702 (b), (c), (e), 154.1870.
Ethyl Chloride	IIG/IIPG ..	.....	.....	I & T .....	R .....	I-D .....	154.1870.
Ethylene .....	IIG .....	.....	.....	I .....	R .....	I-C .....	None.

TABLE 4—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name <sup>1</sup>	Ship type	Independent tank type C required	Control of cargo tank vapor space	Vapor detection <sup>2</sup>	Gauging <sup>3</sup>	Electrical hazard class and group <sup>4</sup>	Special requirements
Ethylene oxide	IG .....	Yes .....	Inert .....	I & T .....	C .....	I-B .....	154.660 (b) (3), 154.1400 (c), 154.1405, 154.1410, 154.1702 (b), (d), (f), 154.1705, 154.1710, 154.1720, 154.1725, 154.1730, 154.1870 (a), (b).
Methane (LNG).	IIIG .....	.....	.....	I .....	C .....	I-D .....	154.703 through 154.709, 154.1854.
Methyl acetylene-propadiene mixture.	IIIG/IIPG ..	.....	.....	I .....	R .....	I .....	154.1735.
Methyl bromide.	IG .....	Yes .....	.....	I & T .....	C .....	I-D .....	154.660 (b) (3), 154.1345 (c) (d), 154.1400 (c), 154.1405, 154.1410, 154.1702 (a), (d), 154.1705, 154.1720, 154.1870 (a), (b).
Methyl chloride.	IIIG/IIPG ..	.....	.....	I & T .....	C .....	I-D .....	154.1702 (a), 154.1870.
Nitrogen .....	IIIG .....	.....	.....	O .....	C .....	.....	154.1755.
Propane .....	IIIG/IIPG ..	.....	.....	I .....	R .....	I-D .....	None.
Propylene .....	IIIG/IIPG ..	.....	.....	I .....	R .....	I-D .....	None.
Refrigerant .....	IIIG .....	.....	.....	.....	R .....	.....	None.
Sulfur dioxide	IG .....	Yes .....	Dry .....	T .....	C .....	.....	154.660 (b) (3), 154.1345 (c), (d), 154.1400 (c), 154.1405, 154.1410, 154.1705, 154.1715, 154.1720, 154.1870 (a), (b).
Vinyl chloride	IIIG/IIPG ..	.....	.....	I & T .....	C .....	I-D .....	154.1405, 154.1410, 154.1702 (a) (b) (d) (f), 154.1710, 154.1740, 154.1745, 154.1750, 154.1818, 154.1830 (f), 154.1870.

<sup>1</sup> Refrigerant gases include non-toxic, non-flammable gases such as: dichlorodifluoromethane, dichloromonofluoromethane, dichlorotetrafluoroethane, monochlorodifluoromethane, monochlorotetrafluoroethane, and monochlorotrifluoromethane.

<sup>2</sup> As used in this column: "I" stands for flammable vapor detection; "T" stands for toxic vapor detection; "O" stands for oxygen detection; and see §§ 154.1345 thru 154.1360.

<sup>3</sup> As used in this column: "C" stands for closed gauging; "R" stands for restricted gauging; and see § 154.1300.

<sup>4</sup> The designations used in this column are from the National Electrical Code.

[CGD 74–289, 44 FR 26009, May 3, 1979; 44 FR 59234, Oct. 15, 1979]

#### APPENDIX A TO PART 154—EQUIVALENT STRESS

specialty approved by the Commandant (CG–522) as equivalent to the following:

I. Equivalent stress ( $\sigma_c$ ) is calculated by the following formula or another formula

$$\sigma_c = \sqrt{\sigma_x^2 + \sigma_y^2 - \sigma_x \sigma_y + 3\tau_{xy}^2}$$

where:

$\sigma_x$ =total normal stress in "x" direction.

$\sigma_y$ =total normal stress in "y" direction.

$\tau_{xy}$ =total shear stress in "xy" plane.